

Tank Bladders for Advanced Monopropellants, Phase I

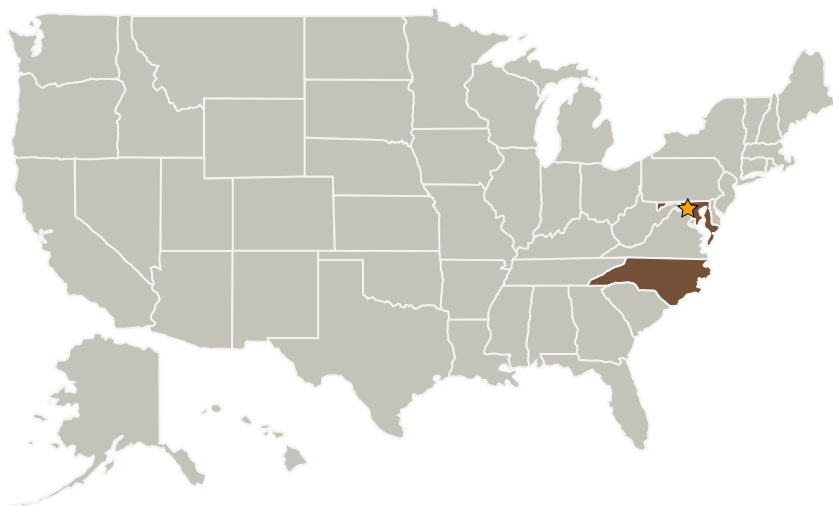
Completed Technology Project (2006 - 2006)



Project Introduction

In response to RFP S8.04 Spacecraft Propulsion, innovations in propulsion technologies are needed to increase the capabilities of the Science Mission Directorate (SMD) spacecraft. Towards this need, MicroPhase Coatings, Inc. (MPCI) proposes tank bladders compatible with advanced monopropellants. MPCI is well underway in development of polymer liners for lightweight propulsion tanks for containment of gelled inhibited red fuming nitric acid (IRFNA) and monomethylhydrazine (MMH) under an Army Redstone Arsenal contract in collaboration with partner Northrop Grumman Space Technology (NGST). Most MPCI bladders are composed of FEP thermoplastic fluoropolymer into which glass flake is compounded for additional barrier properties. Glass flakes within the polymer matrix overlap to yield tortuous paths to chemicals that might otherwise migrate through a polymer matrix. When needed, we also incorporate auxiliary fluorinated silicate coating or even pure gold plate within the bladder interior. Fluoropolymers, glass, gold and silicate coatings are all materials well known for chemical inertness. MPCI's innovation is to combine the materials in a form that yields a flexible bladder which serves as an inert barrier for monopropellant containment and stability. The time is ripe to expand compatibility testing of MPCI's bladder technology to advanced monopropellants for SMD needs.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Microphase Coatings, Inc.	Supporting Organization	Industry	Garner, North Carolina

Primary U.S. Work Locations	
Maryland	North Carolina

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
 - └ TX14.3 Thermal Protection Components and Systems
 - └ TX14.3.1 Thermal Protection Materials